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ABSTRACT

Evaluations of existing pharmacy personnel programs and personal interviews with leaders in the field were conducted to develop a pharmacist and technician task list. Using the survey instrument developed for other occupations, the National Technical Advisory Committee for Pharmacy analyzed and validated the task list. The final organization of the task list contains tasks performed by the pharmacist and technician in dispensing pharmaceuticals, manufacturing bulk compound, prepackaging, sterile solution manufacturing, purchasing and storing, and administration of pharmaceuticals. It was recommended that the task list be used as a guide to break down each task into smaller units and that the tasks be analyzed to determine whether they should be taught in a classroom or clinical situation. In addition to the task list development, the need for pharmacy technicians was demonstrated. Additional background information is available in ED 037 570 and other allied health projects are available as VT 011 425-VT 011 432 in this issue. (SB)

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Interim Report

HOSPITAL PHARMACY TECHNICIAN PROJECT

Development and Validation of the Task Inventory

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Research and Demonstration Grant 8-0627
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UNIVERSITY OF CALIFORNIA, LOS ANGELES
Division of Vocational Education

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Research and Development Project for Curricula and Instruction in Allied Health Occupations

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FOREWORD

The Division of Vocational Education, University of California, is an administrative unit of the University concerned with responsibilities for research, teacher education, and public service in the broad area of vocational and technical education. During 1968 the Division entered into an agreement with the U.S. Office of Education to prepare curricula and instructional materials for a variety of allied health areas. For the most part such materials are related to pre-service and in-service instruction in programs from on-the-job instruction through Associate degree programs.

This interim report is a summary of the functional analysis for the emerging occupation of Hospital Pharmacy Technician. A National Technical Advisory Committee for Pharmacy, plus a number of expert consultants, provided assistance in designing an instrument to identify and validate tasks to be performed by the Pharmacy Technician in health care facilities throughout the nation.

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Objectives

1. To determine whether the national associations in Pharmacy were interested in the development of a pre-professional category of personnel.

2. To develop an educational and training program for the Hospital Pharmacy Technician.

3. To show the methodology by which a final Task List draft was developed for the preparation of curriculum.

Procedure

1. Evaluation of existing medical facility Pharmacy Personnel Programs.

2. Search of the literature.

3. Personal interviews with many of the most distinguished persons in the field.

4. Selection of a National Technical Advisory Committee.

5. Development by the Committee of a Task Inventory to separate the tasks into those to be performed by a Pharmacist and those to be performed by a Technician.

6. Analysis and validation by the Committee of the Task List , based on the survey instrument to be used for other occupations.

Findings and Recommendations

1. The need for a Pharmacy Technician for the hospital Pharmacy has been demonstrated.

2. A Task List has been developed, subdividing tasks and specifying which should be performed by the Pharmacist and which by the Technician.

3. The development of curriculum based on the Task List (see following page) is viewed as the next step.

TECHNICIAN TASK LIST

I. DISPENSING PHARMACEUTICALS

*A. Receive the order

1. Receive direct copy of physician's order

B. Prepare dispensing records

1. In pharmacy

2. In ward

*C. Dose preparation - pre-compounded medications

1. Prepare label

2. Select drug

3. Select container

4. Package and label

5. Perform necessary housekeeping and maintenance

*D. Dose preparation, extemporaneously compounded non-sterile medications

1. Prepare label

2. Select drugs

3. Select equipment

4. Weigh/measure

*5. Combine

6. Select container

7. Package, affix label

8. Perform housekeeping and maintenance tasks

*Tasks so designated can be performed by a Technician, a Pharmacist, or both.

*E. Dose preparation, extemporaneously compounded sterile medications

*1. Follow all steps under "D"

*2. Employ special techniques appropriate to sterile procedures

F. Transport to unit for administration to patients

1. Prepare for mode of transfer to unit

a. Cart

b. Tray

c. Pneumatic tube

d. Dumb waiter

e. Lateral conveyor

f. Messenger

2. Maintain records of delivery

3. Distribute medications to units

4. Organize if necessary for administration of medication to patients

*5. Return drug to stock

*a. Examine

b. Return to stock if unit package

G. Housekeeping and Maintenance

1. Return equipment

2. Return bulk medications to stock

3. Clean area

4. Replenish stock

II. MANUFACTURING/BULK COMPOUNDING
(All Items Except Sterile Solutions)

*A. Prepare work sheet (batch sheet)

B. Select necessary equipment in accordance with master formula

C. Select ingredients

1. Check weights and measures

D. Weigh or measure ingredients

E. Record weights, control numbers and other pertinent information on work sheet

1. Check work sheet in comparison to master formula

F. Combine ingredients as directed on master formula

G. Store completed product under quarantine until control laboratory releases it for packaging

H. Clean and store equipment

I. Package according to master formula instructions

III. PRE-PACKAGING

NOTE: The specific tasks in this section were eliminated from the last draft of the Task List; therefore, the detail below, taken from a prior draft, should be considered tentative major tasks when completing the task breakdown.

A. Analyze the order

B. Check the stock level

C. Determine type of equipment required

*D. Have Pharmacist check your procedure

E. Set up machine for making labels

F. Select drugs

G. Fill out forms and records

H. Select container

I. Measure drugs

J. Fill container

K. Affix label to container

*L. Have Pharmacist check procedure

M. Store and distribute pre-packaged pharmaceuticals

IV. STERILE SOLUTION MANUFACTURING

A. Repeat "A" through "E", Section II - "Manufacturing/Bulk Compounding"

B. Prepare product under aseptic conditions in accordance with good sterile techniques

C. Fill container under proper conditions

D. Sterilize under correct conditions of temperature, pressure, and time

*E. Inspect finished product for clarity and vacuum

F. Label acceptable product with correct labels

G. Send sample to laboratory for testing

H. Store completed product under quarantine until control laboratory releases it

I. Clean and store equipment

V. PURCHASE, INVENTORY, RECEIVE, AND STORE

*A. Purchasing and inventory control

1. Maintain inventory records

*2. Prepare purchase order on reorder form

3. Maintain purchase order suspense file

B. Receive drugs

1. Check identification

a. Compare drug name, strength, dosage form, etc. to packing slip

2. Check for damage

3. Check for shortage

C. Insure proper storage

1. Insure general safety

a. Provide special security storage for restricted drugs

b. Provide quarantine for raw drug materials

2. Check temperature and shelf life requirements

3. Check flammability requirements

*D. Process invoice

1. Check for receipt of material

2. Compare invoice with purchase order and packing slip

3. Distribute for payment

E. Release from storage

VI. ADMINISTRATION OF PHARMACEUTICALS

A. Administer medication

1. Verify

2. Administer

3. Record if administered

4. Communicate and record if not taken by patient

HOSPITAL PHARMACY TECHNICIAN PROJECT

INTERIM REPORT

Development and Validation of the Task Inventory

A. INTRODUCTION

The occupations assigned to this division fall in the area of medical facility administrative or service functions and pharmacy and dietary occupations.

A survey of occupational needs and educational programs in these areas identified only one formalized program for training Pharmacy Assistants sponsored by an educational institution.[1] From an educational standpoint, therefore, Pharmacy Technician training constituted an emerging field. It was felt that development of educational materials in this field might make a greater contribution than redevelopment of an existing training program in some other occupational area.

Supporting this decision was the discovery that, according to manpower statistics, there was a great number of non-professional people working in the Pharmacy field in the United States.[2] Except for the training programs of the Armed Forces and the Veterans Administration, and the one program mentioned above, each hospital pharmacy appeared to have developed its own technician or assistant, based on its own individual needs. This heterogeneity of functions became quite apparent when individual programs were compared.[3]

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[1]Crane Junior College in Chicago, Illinois

[2]Health Manpower Perspective: 1967. U.S. Department of Health, Education and Welfare. Public Health Service Publication No. 1667

[3]The following medical facility pharmacy non-professional personnel programs were evaluated: "Procedure Manual for Non-Professional Pharmacy Assistants, University of California Student Health Services," 1969, provided by Kenneth J. Ballard, Senior Pharmacist; "An Analysis of Tasks and Job Behaviors Appropriate for Pharmacy Technicians in the Acute General Hospital," September, 1969, provided by William E. Smith, Director of Pharmacy and Central Services at Memorial Hospital of Long Beach, California; data on non-professionals in hospital pharmacy provided by Clifton J. Latiolais, Director, Department of Pharmacy, the Ohio State University Hospitals, Columbus, Ohio; "Pharmacy Assistant Series," June, 1961, provided by Arthur Davis, Veterans Administration, Wadsworth Pharmacy, Los Angeles, California; "Pharmacy Assistant Training Manual," January, 1966, provided by Robert L. Ravin, Director of Pharmaceutical Services, St. Joseph Mercy Hospital, Ann Arbor, Michigan; "Technicians Training Program," December, 1968, provided by Sister Jane M. Durgin, Director or Pharmacy Services, Mercy Hospital, Rockville Centre, New York; "The Allied

The absence of any generic Pharmacy non-professional, whose job activities might be used as the basis for curriculum development, and the divergence of standards imposed by state licensing laws, led to the problem of identifying the tasks which a Pharmacy Technician or Assistant could or should perform without reference to existing situations or programs. Because of limited curricula and the existence of unrelated or unequal tasks, it was decided to develop appropriate curricula and instructional materials in the Pharmacy field.

Before a final curriculum could be developed, it was felt necessary to determine if the national associations involved were particularly interested in sub-professional occupational development. The American Society of Hospital Pharmacists, the American Pharmaceutical Association, the National Association of Boards of Pharmacy, and the American Association of Colleges of Pharmacy had met for several years to consider the development of a non-professional assistant for the medical facility pharmacy.

When this information was received, the American Society of Hospital Pharmacists had scheduled a workshop in January 1969 to discuss further development of a non-professional in the hospital or medical facility. All four associations were represented at this workshop. They expressed interest in the development of a sub-professional Pharmacy curriculum by the Allied Health Professions Projects.

In March 1969 a Task Force funded by the American Pharmaceutical Association was appointed to "delineate the roles of the pharmacist and the sub-professional in pharmacy."[4]

Other discussions revealed that the majority of the retail pharmacy groups were not interested, at this time, in developing a non-professional for the community pharmacy.

It was decided, therefore, that it would be appropriate to strive for the development of a curriculum and instructional materials for the non-professional individual, such as a technician for the medical facility, with a training program which might take as long as two years.

Upon reaching this decision, the main objective became the development of an educational and training program for the Hospital Pharmacy Technician. The basis for this instructional material would be provided by compiling and synthesizing an inventory of the tasks a technician should perform. Once the

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Health Program," January, 1969, provided by Louis Gdalman, Chief Pharmacist, Chicago City College, Crane Campus; "Pharmacy Methodology Manual," n.d., provided by Karl G. Bartscht, University of Michigan.

[4]Although the Task Force was made up of members of the four professional organizations as well as other consultants, all participants acted in their individual capacity and represented no particular organization.

inventory had been agreed upon by a Technical Advisory Committee, the skills and knowledge required to carry out the tasks would be determined. Teaching materials would then be devised which would enable the student to perform his specific tasks.

This paper is presented to report the creation of the Medical Facility Pharmacy Technician Task List for the purposes of curriculum development.

B. CREATION OF TASK LIST

The following steps were taken in evolving the final draft of the Medical Facility Pharmacy Task List for purposes of curriculum development. While a preliminary draft of a task inventory was being developed by the Project, a National Technical Advisory Committee was being selected to advise on the development of curriculum. The Committee then met and reviewed the draft. They deleted some tasks and added others, and separated the functions of the Pharmacist and the Technician. After this, the task list was validated by Committee analysis, which included a review, on the basis of skills and knowledge as well as other considerations, of the tasks they had selected. The last step included the National Technical Advisory Committee analysis input, a final review, and the selection of a final draft of the task list for the Hospital Pharmacy Technician.

National Technical Advisory Committee

The National Technical Advisory Committee, which functions as a governing board in the development of curriculum materials, will make decisions throughout as to specific directions to be taken by the Pharmacy Technician Project.

The following criteria were employed to select members of the Committee:

1. There should be representatives from national associations interested in the development of the Pharmacy Technician. They would act as consultants on the curriculum and assist the Project to disseminate materials.

2. A second group to be considered would be the future employers or "consumers" of these trained individuals.

3. It probably would be appropriate to include a physician who would be professionally involved with some of the services that the trained individual might provide.

4. People who now train Pharmacy Technicians or non-professionals in the Pharmacy probably should be included to take advantage of their experience. It was proposed, therefore, that the Armed Forces and the Veterans Administration be represented because of their specific experience in developing Pharmacy Technicians.

5. The final consideration was the selection of an individual who was actually employed as a practicing Pharmacy Technician.

The following individuals were named to the National Technical Advisory Committee for the Pharmacy Technician, based on the above criteria:

Mr. Joseph Beckerman, Chief of Pharmacy Service, University of California, Los Angeles, and President of the American Society of Hospital Pharmacists.

Dr. Donald C. Brodie, Associate Dean for Pharmacy Affairs at the University of California, San Francisco, and representative of the American Association of Colleges of Pharmacy.

Dr. Edward S. Brady, Associate Dean, University of Southern California, Los Angeles, alternate to Dr. Donald C. Brodie, representing the American Association of Colleges of Pharmacy.

Mr. Roger Cain, Assistant Executive Director of the American Pharmaceutical Association, Washington, D.C., representing the American Pharmaceutical Association.

Sister Ferdinand M. Clark, Administrator of Mercy Hospital, Pittsburgh, Pennsylvania.

Sister Jane M. Durgin, Director of Pharmacy Services at Mercy Hospital, Rockville Centre, New York.

Major G. Jay Lafleur, M.S.C., U.S.A., Chief, Pharmacy Branch, Fort Sam Houston, Texas.

Mr. Fred T. Mahaffey, Executive Director-Secretary of the National Association of Boards of Pharmacy, Chicago, Illinois, and representing this national organization.

Mr. Alfred J. Duncan, Executive Secretary of the Arizona State Board of Pharmacy, Tucson, Arizona, also representing the National Association of Boards of Pharmacy. Mr. Duncan is an alternate to Mr. Mahaffey.

Robert F. Maronde, M.D., Professor of Medicine at the University of Southern California, Los Angeles.

Mr. Joseph A. Oddis, Executive Secretary of the American Society of Hospital Pharmacists, Washington, D.C., representing his organization.

Dr. Warren E. McConnell, Education Director,
American Society of Hospital Pharmacists,
Washington, D.C., alternate for Mr. Oddis.

Mr. Robert L. Ravin, Director of Pharmaceutical
Services, St. Joseph Mercy Hospital,
Ann Arbor, Michigan.

It is noted that there is no representation from the Veterans Administration nor from a Medical Facility Pharmacy Technician. In the first case, Mr. Arthur Davis, Chief of Pharmacy Service, Wadsworth Veterans Hospital, Los Angeles, was extremely cooperative and was selected to be a consultant on an individual basis. In addition, it is probable that Mr. Ralph Boehm, Chief, Staff Resources and Development Division, Pharmacy Division, Veterans Administration, Washington, D.C., may join the Committee in the future.

The second individual not included was the Technician himself. This omission reflected the inability to locate an individual who would be representative of a common field and be able to provide meaningful input to the Committee.

Development of Task Inventory

While the Committee was being selected, the Project was developing a Pharmacy Task Inventory for initial review by the Committee. The initial Task Inventory was specifically designed to cover the total Hospital Pharmacy function. This would include tasks that might be assigned to the Technician, the Pharmacist, and other individuals who might be employed in the Medical Facility Pharmacy.

In the development of the Task Inventory, the staff surveyed periodicals, policy manuals of various facilities, job descriptions (particularly from the Veterans Administration), and some specific task lists that did exist. Personal interviews were conducted with Medical Facility Pharmacists in the local area. All these materials were reviewed to determine this inventory. The list of actual sources used in the development of the inventory appears in the reference list.[4]

Revision of Task Inventory

The first meeting of the National Technical Advisory Committee was held 24-25 March 1969 in the Project Offices at UCLA. At that meeting, the Committee reviewed the Task Inventory as outlined and decided to delete some tasks, to add others, and to restructure the organization of the Task List, dividing the tasks between those that should be performed by a Pharmacist and those that could be assigned to a Technician.

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[4]See list of references on page 29.

Specifically, the Committee determined that Item I, SOLUTION AND COMPOUND MANUFACTURE, and Item II, PRE-PACKAGE, should be revised by a local sub-committee consisting of Mr. Beckerman and Dr. Brady. The Committee completely redrafted Item III, INPATIENT PHARMACEUTICALS, and Item IV, OUTPATIENT PHARMACEUTICALS, producing a combined revision entitled DISPENSING PHARMACEUTICALS.[5] Item V, PURCHASE, INVENTORY, RECEIVE, AND STORE, was basically accepted with minor changes. Item VI, ADMINISTRATION, was handled in two ways. It was decided that control procedures should be integrated into all other sections as they occurred in the rest of the Task List, while such subjects as secretarial, clerical, accounting, and finance functions would not be relevant either to a Pharmacy Technician task or a Pharmacist task and could be eliminated entirely from the inventory. It was proposed that, in this case, these functions should be assigned to other personnel with specific training and background. The Committee decided that Item VII, OPERATE AND MAINTAIN EQUIPMENT, should be integrated into the other sections. Item VIII, RESEARCH AND EDUCATION, it was felt, should be eliminated for the present. It was the Committee's opinion that this area could be explored in the future, after the basic Technician program had been developed.

The Committee's deliberations resulted in organization of the Task List under the following major headings:

I. Dispensing Pharmaceuticals

II. Manufacturing/Bulk Compounding

III. Sterile Solution Manufacturing

IV. Purchase, Inventory, Receive, and Store[5]

Survey Procedure

Under the Grant Proposal, the Project is charged with the responsibility of surveying the field to determine what the health professional or allied health person is actually doing. In almost all other occupations, a field survey will be carried out for this purpose. In the Pharmacy field, however, neither a non-professional nor a Technician was to be found in the survey sample or in the medical facilities, to relate to the functions designed for the Technician as prescribed by the Committee. It was decided, therefore, that the Committee would analyze or validate the Task List based on the survey instrument to be used for other occupations.

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[5]Appendix

A number of assumptions have been developed for the survey in the field:

1. Frequency. This question would arise, based on the assumption that if a task occurs often it should be included in the curriculum. However, if the task occurs infrequently, e.g., once a year, it probably should not be included in the curriculum. When the analysis program for the Committee was being developed, the Project was in the process of determining Frequency scales. At that time, no decision had been reached as to whether an absolute or a relative scale for Frequency should be used. For this reason, in Exhibit 1, both a relative and an absolute scale are used in asking questions about Frequency.

2. Importance. As seen in Exhibit 2, Importance was defined in terms of the criticality of consequences of error. Error, in turn, could be defined in terms of dollars, equipment damage, or employee-patient injury. High Importance could, in actual fact, negate a low Frequency score, indicating that a task should be included in the curriculum. For example, though first-aid or disaster procedures may never be carried out on an individual basis, these procedures would be included in the curriculum because of their importance in the case that some day they might be needed. The scale for Importance is shown in Exhibit 2.

3. Skills Required. Here, the assumption would be that the tasks requiring higher skills would be the Pharmacist's tasks and those requiring lower skills would be Technician's tasks.

4. Knowledge Required. The analysis was to test an assumption that the task calling for the greater amount of knowledge would be more likely to be Pharmacist's task, while the task requiring less knowledge would more likely be the Technician's task. The scale for this can be found in Exhibit 4.

5. Frequency and Importance. A combination of 1 and 2 above would be a heavy indicator for inclusion in a curriculum. In other words, if a task was high in Importance and high in Frequency it should be included in the curriculum. If a task was low in Importance and low in Frequency, it should not be included in the curriculum.

6. Skills and Knowledge Required. The combination of items 3 and 4 assumed that tasks having high Knowledge but relatively low Skills would be the Pharmacist's tasks, while those having high Skill requirements but possibly a low Knowledge requirement should be the Technician's tasks.

EXHIBIT 1

1. FREQUENCY

Defined: How often is the task performed?

Scale:
1. Daily
2. Weekly
3. Approximately once a month
4. Rarely
5. Never

2. RELATIVE FREQUENCY

Defined: This is the second of the two frequency scales we are considering. In terms of the relative scale shown below, frequency is defined as the amount of time spent at a given task, relative to the amount of time spent on other tasks listed in the inventory.

Scale:
1. Very much below average
2. Below average
3. Slightly below average
4. About average
5. Slightly above average
6. Above average
7. Very much above average

Reason:
a. Frequency will provide grounds for either exclusion or inclusion in a possible curriculum.

b. It may provide relative value to task in a curriculum.

c. Teaching methodology may vary in relation to repetitive nature of the task.

d. Two frequency measurements are used to test validity of absolute versus relative scales.

EXHIBIT 2

3. IMPORTANCE

Defined: Importance can be defined as how critical a task is in terms of consequences of error. Error can be defined in terms of dollars, equipment damage, employee or patient injury. The scale for importance would be directly related to the error itself.

Scale:
1. None
2. Negligible
3. Reparable
4. Irretrievable

Reason: Gives an indicator for inclusion and/or relative emphasis in a curriculum

EXHIBIT 3

4. SKILLS

Defined: The skill scale relates simply to selection of one or more of the three types of skills required for the task. Skills are defined as abilities required for satisfactory performance, i.e.,

a. Manual skills, such as hand use-perceptual,

b. Skills that require observation,

c. Psychomotor skills, which combine the first two; an example of this could be hand-eye coordination.

Scale:
1. Manual skill
2. Perceptual skill
3. Psychomotor skill

Reason:
a. Indicator of teaching methodology

b. Determine clinical teaching component

c. Could determine inclusion or exclusion from curriculum

EXHIBIT 4

5. KNOWLEDGE

Defined: Recall of specific facts and principles

Scale:
1. NONE. The task requires no application of knowledge in the subject area under consideration.

2. STRAIGHT RECALL. The task requires the performer to recognize and use terms, materials, or equipment in a given subject area in a rote manner.

3. RECALL (varied). The task requires the application of knowledge in a given subject area. The performer must know how to select and use a number of special materials, or instruments, or procedures in the subject area when the performer is requested to do so by someone in the task situation.

4. SELECTION OF ALTERNATIVES. The task requires the application of general principles or basic theory in a given subject area. The performer must know how the equipment or concepts of the subject area function in the task situation and, using basic theory, must be able to handle any changes from the usual conditions observed in the task, or to solve problems such as those presented by the task.

5. PROBLEM SOLVING. The task requires the application of theoretical concepts in a given subject area to solve a range of problems associated with the task. The performer must know the range of theories in the intellectual structure of the subject area's discipline.

Reason:
a. An indicator of teaching methodology

b. Determines level of instruction

c. Could determine inclusion or exclusion from curriculum

Exhibit 5 is a form used to present the Task List for analysis to the National Technical Advisory Committee for Pharmacy. It is entitled a "sample questionnaire draft." On the left side of the column of the sample questionnaire draft, the tasks were entered without designation for Pharmacist or Technician.

EXHIBIT 5

SAMPLE

QUESTIONNAIRE

DRAFT

Enter appropriate number or numbers which indicate your answers to

each subject about each of the tasks listed (see preceding definitions and scales.)

TASK	FREQUENCY	RELATIVE FREQUENCY	IMPORTANCE	KIND OF SKILL	KNOWLEDGE	
1.						
2.						
3.						
4.						
5. EXAMPLE Receive Direct copy of Physicians order	1	7	3	3	2	

Except for the Pharmacist and the Technician designations, this Task List had been developed by the Committee in its first meeting and is presented in the Appendix. On the right hand side of the questionnaire were entered columns for Frequency, Relative Frequency, Importance, Skills and Knowledge. The committee was asked to enter the number relating to the scales presented in Exhibits 1 through 4, above. In other words, for Importance, 1 equals "none", 2 equals "negligible." The Committee members did not receive the entire Task

List; it was divided among them in 12 different sections, typed on the questionnaire form and mailed to them. Each completed his share of the survey and returned it to the Project office. An example of a completed analysis is shown below, in Exhibit 6.

EXHIBIT 6

SAMPLE QUESTIONNAIRE DRAFT

Enter appropriate number or numbers which indicate your answer to each subject about each of the tasks listed (see preceding definitions and scales.)

TASK Appendix Pages A-14 and A-15 (Sections A through J)	FREQUENCY	RELATIVE FREQUENCY	IMPORTANCE	KIND OF SKILL	KNOWLEDGE	
A. Prepare product under aseptic conditions in accordance with good sterile techniques	1	4	4	2	4	
B. Prepare bottles or vials by proper washing procedures followed by final distilled water rinses.	1	4	3	1	1	
C. Fill container under proper conditions	1	4	3	1	1	
D. Autoclave under correct conditions of temperature, pressure and time	1	2	4	2	2	
E. Remove material from autoclave allowing product to cool	1	2	2	1	2	
F. Inspect finished product for clarity and vacuum	1	6	4	2	2	
G. Label acceptable product with correct labels	1	4	4	1	1	
H. Send sample to laboratory for sterility and pyrogen testing	1	1	3	1	2	
I. Store completed product under quarantine until control laboratory releases it for packaging	1	2	2	1	1	
J. Clean and store equipment	1	4	3	1	2	

Analysis of Committee Survey Data

The results of the Committee analyses are presented in Tables 1 through 8.

It was decided to take the scales for each question asked -- Frequency, Relative Frequency, Importance and Skills, and Knowledge -- and divide them in half. In other words, the lower half of the scale would be "low", and the upper half of the scale would be "high." For example, in the case of Importance, low Importance would represent response for "none" and "negligible" and high Importance would represent "reparable" and "irretrievable." For scales such as Frequency and Relative Frequency, where there was an odd number of entries in the scale, the division was made arbitrarily at either the low end or the high end of the scale, as presented in Exhibit 7, below.

EXHIBIT 7

Definitions

Importance

Low
- 1--None
- 2--Negligible

High
- 3--Reparable
- 4--Irretrievable

Skill

Low
- 1--Manual Skills

High
- 2--Perceptual Skills
- 3--Psychomotor Skills

Knowledge

Low
- 1--None
- 2--Straight Recall
- 3--Recall (varied)

High
- 4--Selection of Alternatives
- 5--Problem Solving

Frequency

High
- 1--Daily
- 2--Weekly

Low
- 3--Approximately once a month
- 4--Rarely
- 5--Never

Relative Frequency

Low
- 1--Very much below average
- 2--Below average
- 3--Slightly below average

High
- 4--About average
- 5--Slightly above average
- 6--Above average
- 7--Very much above average

Table I, below, compares Importance, Skill, and Knowledge in relation to the Pharmacist's tasks. It can be seen that 68.9 percent of the Pharmacist's tasks fell into the category of high Importance-high Skill-high Knowledge. This confirms the original assumption that tasks with both high Importance and high Knowledge should be Pharmacist's tasks; it also shows, however, that a high Skill factor also would be likely to characterize the Pharmacist's tasks.

TABLE 1

Number of Tasks with Each Pattern

IMPORTANCE, SKILL AND KNOWLEDGE ANALYSIS

PHARMACIST TASKS

Importance	Skill	Knowledge	Number	Per Cent
High	High	High	31	68.9
High	High	Low	8	17.8
High	Low	High	0	0.0
High	Low	Low	2	4.4
Low	High	High	0	0.0
Low	High	Low	3	6.7
Low	Low	High	0	0.0
Low	Low	Low	1	2.2
			45	100%

Table 2, on the following page, shows the tasks which the Committee said were Technician's tasks rated by Importance, Skill and Knowledge. It was found that in this case 53.6 percent of the tasks fell into the high Importance-high Skill-low Knowledge area, validating our original hypothesis that the high Skill-high Importance task could be a Technician task, but that Knowledge would not necessarily be high.

TABLE 2

IMPORTANCE, SKILL AND KNOWLEDGE ANALYSIS

TECHNICIAN TASKS

Importance	Skill	Knowledge	Number	Per Cent
High	High	High	13	18.9
High	High	Low	37	53.6
High	Low	High	0	0.0
High	Low	Low	9	13.0
Low	High	High	0	0.0
Low	High	Low	4	5.8
Low	Low	High	0	0.0
Low	Low	Low	6	8.7
			69	100%

Table 3, on the following page, compares Frequency and Relative Frequency for the Pharmacist's tasks. The same comparison is made for the Technician's tasks in Table 4, also on the following page. In both cases, high Frequency occurs at the same rate as low Relative Frequency. It is assumed that this reflects the opinions of respondents who desire to put something at the about average level, which represents once a month on the absolute scale.

TABLE 3

FREQUENCY AND RELATIVE FREQUENCY ANALYSIS

PHARMACIST TASKS

Frequency	Relative Frequency	Number	Per Cent
High	High	17	53.1
High	Low	13	40.7
Low	High	1	3.1
Low	Low	1	3.1
		32	100.0 %

TABLE 4

FREQUENCY AND RELATIVE FREQUENCY ANALYSIS

TECHNICIAN TASKS

Frequency	Relative Frequency	Number	Per Cent
High	High	22	44.9
High	Low	26	53.1
Low	High	0	0.0
Low	Low	1	2.0
		49	100 %

The next comparison, Table 5, below, presents the Frequency/Importance analysis in relation to the Pharmacist's tasks. In this case, no Pharmacist task has been assigned both low Importance and low Frequency. We would assume then, that no tasks would be excluded from the Technician's curriculum because of low Frequency and low Importance.

TABLE 5

FREQUENCY AND IMPORTANCE ANALYSIS

PHARMACIST TASKS

Frequency	Importance	No. of Tasks
Low	High	2
Low	Low	0

The next comparison, in Table 6, below, applies to Frequency/Importance analysis of the Technician's tasks. Again, we have no low Frequency and low Importance tasks, so we assume, according to the original hypothesis, that no tasks for the Technician should be eliminated from the curriculum.

TABLE 6

FREQUENCY AND IMPORTANCE ANALYSIS

TECHNICIAN TASKS

Frequency	Importance	No. of Tasks
Low	High	1
Low	Low	0

In Table 7, below, Relative Frequency/Importance are compared in relation to the Pharmacist's tasks. Again, we have no low Relative Frequency and low Importance. We would assume that all tasks should be included in the Pharmacy curriculum that were assigned to the Pharmacist.

TABLE 7

RELATIVE FREQUENCY AND IMPORTANCE ANALYSIS

PHARMACIST TASKS

Relative Frequency	Importance	Number	Per Cent
High	High	24	53.3
High	Low	4	8.9
Low	High	17	37.8
Low	Low	0	0.0
		45	100.0 %

In Table 8, on the following page, Relative Frequency and Importance are compared for a Technician task. In this case, we do have six tasks which fall in the category of low Importance and low Relative Frequency. However, it is noted that these combinations of low Relative Frequency and low Importance fell at the slightly below average or borderline break between "high" and "low." For this reason, they were not considered significant. Therefore, again we have no tasks that should be eliminated from the Pharmacy Technician curriculum on the basis of this analysis.

TABLE 8

RELATIVE FREQUENCY AND IMPORTANCE ANALYSIS

TECHNICIAN TASKS

Relative Frequency	Importance	Number	Per Cent
High	High	26	37.7
High	Low	4	5.8
Low	High	33	47.8
Low	Low	6	8.7
		69	100%

In summary, no information obtained from the survey itself called for elimination of any tasks from the curriculum, based on the assumptions made. The tasks selected by the Committee at Technician level were frequent enough, important enough and required the right amount of skills and knowledge. Response to the survey, then, validated the Committee's original decision on selecting tasks that the Pharmacist and Technician should perform.

The final draft of the Task List for curriculum development was completed at the August 14-15, 1969, National Technical Advisory Committee Meeting for Pharmacy. The Committee analysis provided basically no changes in the Task List; however, the Committee members decided to redraft the Task List during their deliberations at the meeting.

This final organization of the Task List included six major divisions:

I. Dispensing Pharmaceuticals

II. Manufacturing Bulk Compound

III. Prepackaging

IV. Sterile Solution Manufacturing

V. Purchase, Inventory, Receive and Store

VI. Administration of Pharmaceuticals

Items I, II, IV and V were basically taken from the previous draft of the Task List, which is reflected as the Appendix. Item III existed in the original draft but was eliminated during the first Committee meeting and then later was reinserted. The specific tasks in this section were taken basically from that first draft, and are considered tentative for curriculum development. Item V, ADMINISTRATION OF PHARMACEUTICALS, was basically developed at the meeting and is the new item for the final draft for curriculum. The Task List as presented for curriculum, therefore, includes two sections which were originally not part of the previous draft.

The Pharmacist's tasks were eliminated from this draft except in cases where they were combination tasks that could be performed by either a Pharmacist or a Technician.

C. RECOMMENDATIONS

Future recommendations include two uses of the Task List for curriculum development. The first use would be as a guide to breaking down each task into smaller units. This would enable the Project to more easily develop specific skills and knowledge required to perform the tasks, as well as finally to formulate behavioral objectives.

An example of how this task breakdown might be of help is presented in Exhibit 8, on the next page. In Exhibit 8, the detail can be seen that will develop from task breakdown, for Exhibit 8 includes only one sub-section under Item I, DISPENSING PHARMACEUTICALS, which is, "Dose Preparation - Pre-Compound Medication."

The second use of the Task List in curriculum development will be in analyzing the clinical component of the training program by the specific skills and knowledge required for each task - in other words, which tasks need to be taught in the classroom, versus which tasks need to be taught in the clinical setting. The Committee is currently in the process of completing the work exemplified in Exhibit 8. Members were assigned in groups of two, to accomplish the total breakdown of the five major headings in the final Task List for curriculum. An example of future material for curriculum to be based on the Task List is under development by the Project for Item V, PURCHASE, RECEIVE, INVENTORY, STORE.

A Task List of this sort could be used for developing staffing patterns in existing facilities. It could also be used for possible reorganization of operating pharmacy departments, and for planning new pharmacy departments in medical facilities. In the future, the Task List will be utilized for the development of core courses.

At the time that core courses are developed, we will have to recall from the original draft the types of tasks that were eliminated from the Task List that do not belong to the Pharmacist or Technician, such as certain clerical, secretarial, and finance functions.

4/27/70
Sylva Grossman, editor

EXHIBIT 8

TASK: Prepare the label

(TASKS & SUB-TASKS)	(SKILLS & KNOWLEDGE)
I. Dispensing Pharmaceuticals C. Dose preparation--pre-compounded medications 1. Prepare the label	
a. Read the order	
(1) Name of drug	(1) Recognize and spell the names and dosage forms and synonyms of 250 of the most commonly prescribed drugs
(2) Strength - dosage form	(2) Systems of weights and measurements most commonly used
(3) Quantity	(3) Recognize and translate (100) prescription and medical abbreviations
(4) Frequency of administration	(4) Same as (3) above
(5) Dosage	(5) Same as (3) above
(6) Route of administration	(6) Same as (3) above
(7) Patient identification--room number	(7) None (assume ability to read and hospital orientation including physician's name and hospital services)
(8) Doctor identification	(8) None (assume ability to read and hospital orientation including physician's name and hospital services)
(9) Dosage instructions	(9) Same as (3) above
(10) Date of order and date of implementation	(10) None (assume ability to read and hospital orientation including physician's name and hospital services)

TASK: Prepare the label (continued)

(TASKS & SUB-TASKS)	(SKILLS & KNOWLEDGE)
b. Select the appropriate blank label(s)	b. (1) Recognize appropriate label and container size
	b. (2) Ability to choose supplementary label
c. Type the label with proper identification	c. (1) Be able to type a 150 character label in 30 seconds in proper format
d. Proof label against order and have Pharmacist verify	d. (1) Repeat c.(1) above

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Appendix

I. DISPENSING PHARMACEUTICALS

	Pharmacist or Technician Functions
A. Receive the Order	P/T
1. Receive direct copy of physician's order	T
2. Receive verbal order from physician	P
a. Prepare written form	
B. Review the order	P
1. Interpret the order	
2. Evaluate the order	
a. Profile card	
3. Clarify order if required	
4. Certify	
a. If A-1, by R. Ph.	
b. If A-2, by M.D.	
C. Prepare dispensing and administration records	T
1. For master file	
a. In pharmacy, profile	
b. In ward, Kardex	
2. Nursing notes	
3. Medical ticket or list	
4. Billing record	
5. Dispensing record	
D. Certification and verification of records	P

	Pharmacist or Technician Functions
E. Dose preparation - pre-compounded medications	P/T
1. Prepare label	T
2. Select drug	T
3. Select container	T
4. Package and label	T
5. Certify completed order	P
6. Perform necessary housekeeping and maintenance chores (Section F-12)	T
F. Dose preparation, extemporaneously compounded non-sterile medications	P/T
1. Prepare label	T
2. Select drugs	T
3. Verify drug selection	P
4. Select equipment	T
5. Calculate weights and measures	P
6. Weigh/measure	T
7. Verify weights/measures	P
8. Combine	P/T
9. Select container	T
10. Package, affix label	T
11. Verify	P
12. Housekeeping and maintenance	T

	Pharmacist or Technician Functions
G. Dose preparation, extemporaneously compounded sterile medications	P/T
1. Follow all steps under "F"	P/T
2. Employ special techniques appropriate to sterile procedures	P/T
H. Transport to unit for administration to patients	P/T
1. Prepare for mode of transfer to unit	T
a. Cart	
b. Tray	
c. Pneumatic tube	
d. Dumb waiter	
e. Lateral conveyor	
f. Messenger	
2. Maintain records of delivery	T
3. Distribute medications to units	T
4. Organize if necessary for administration of medication to patients	T
a. Prepare for individual dose from multiple-dose package	
5. Administer medication	T
a. Verify	
b. Administer	
c. Record if administered	
d. Communicate and record if not taken by patient	
6. Processing unadministered medications	P

Pharmacist or Technician Functions

a. Classify returns

(1) Pickup order

(2) Reconcile return with order

(3) Determine drug credit

(4) Enter amount of credit

b. Return drug to stock

(1) Examine

(a) Deterioration

(b) Breakage

(c) Expiration time

(d) Re-usability

(2) Pour into stock bottle

I. Deliver to patient for self-administration P

1. Counsel patient

a. Obtain drug use information

(1) Adjust patient profile if appropriate

(2) Consult physician if contraindication exists

J. Housekeeping and maintenance T

1. Return equipment

2. Return bulk medications to stock

3. Clean area

4. Replenish stock

II. MANUFACTURING/BULK COMPOUNDING
(All Items Except Sterile Solutions)

		Pharmacist or Technician Functions
A.	Prepare master formula	P
B.	Prepare work sheet (batch sheet)	P
C.	Select necessary equipment in accordance with master formula	T
D.	Select ingredients	T
E.	Check ingredients	P
F.	Weigh or measure ingredients carefully	T
G.	Check weights and measures	P
H.	Record weights, control numbers and other pertinent information on work sheet	T
I.	Check work sheet in comparison to master formula	P
J.	Combine ingredients as directed on master formula	T
K.	Store completed product under quarantine until control laboratory releases it for packaging	T
L.	Clean and store equipment	T

III. STERILE SOLUTION MANUFACTURING

	Pharmacist or Technician Functions
A. Prepare product under aseptic conditions in accordance with good sterile techniques	T
B. Prepare bottles or vials by proper washing procedures followed by final distilled water rinses	T
C. Fill container under proper conditions	T
D. Autoclave under correct conditions of temperature, pressure and time	T
E. Remove material from autoclave allowing product to cool	T
F. Inspect finished product for clarity and vacuum	P
G. Label acceptable product with correct labels	T
H. Send sample to laboratory for sterility and pyrogen testing	T
I. Store completed product under quarantine until control laboratory releases it for packaging	T
J. Clean and store equipment	T

IV. PURCHASE, INVENTORY, RECEIVE, AND STORE	Pharmacist or Technician Functions
A. Pharmacist determines specifications, purchasing responsibilities and acceptable vendors	P
B. Purchasing and inventory control	P/T
1. Maintain inventory records	T
a. Manual	
b. EDP	
2. Determine reorder points	P
a. Manual	
b. EDP	
3. Prepare purchase order on reorder form	P/T
a. Manual	P/T
(1) Special legally required order forms prepared by Pharmacist	P
(2) Prepare non-restricted forms	T
b. EDP	T
(1) Prepare non-restricted forms	T
4. Obtain approval for purchase order from Pharmacist	P
5. Maintain purchase order suspense file	T
a. Manual	
b. EDP	
C. Receive drugs	T
1. Check identification	
2. Check for damage	

	Pharmacist or Technician Functions
3. Check for shortage	
a. Compare packing slip with purchase order	
D. Insure proper storage	T
1. Insure general safety	
a. Provide special control storage for restricted drugs	
b. Provide quarantine for raw drug materials	
2. Check temperature requirements	
3. Check flammability requirements	
E. Process invoice	P/T
1. Check for reception of material	T
2. Compare invoice with purchase order and packing slip	T
3. Approve for payment	P
4. Distribute for payment	T

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